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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BRYANT, DOUGLAS J.	
ART UNIT	PAPER NUMBER
4123	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/552,805	BRIL ET AL.	
	Examiner	Art Unit	
	DOUGLAS BRYANT	4123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 April 0225* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Construction

The following elements are not construed under 35 U.S.C. 112 6th paragraph because "for" was not used:

a) Regarding claim 12, line 6, "receiving means"

b) Regarding claim 12, line 8 "evaluating means"

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) The following term lacks antecedent basis:

   a. said step of identifying availability of memory - claim 5, lines 2-3

   b. said selected one or more task – claim 11, lines 4-5.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-20 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention.

Regarding claims 1,14 and 18, while the claims recite a series of steps or acts to be performed, a statutory "process" under 35 U.S.C. 101 must (1) be tied to a particular machine or apparatus or (2) transform a particular article to a different state or thing (See In re Bilski, 545 F.3d 943, 88 USPQ2d 1385 (Fed Cir. 2008)). The instant claims neither transform a particular article nor positively tie to a particular machine or apparatus and therefore do not qualify as a statutory process.

Regarding claims 7, the claim is directed to a "scheduler" or machine, but fails to disclose physical "things". The claim elements are construed as software. Since the word scheduler is recited only in the preamble, and the body of the claim only recites software elements, the claim is reasonably interpreted as directed to a combination of software elements. While the preamble recites a scheduler, the claim as a whole cannot reasonably be interpreted as a machine, since under 101, a machine is defined as a physical device or a combination of devices having functionalities to effect an action or a result, and the software is not physical devices or objects. Thus, the claim only recites software per se (descriptive material covered in MPEP 2106.01), which constitute as non-statutory subject matter.

Regarding claims 12, the claim is directed to a "system" or machine, but fails to disclose physical "things". The claim elements are construed as software. Since the word system is recited only in the preamble, and the body of the claim only recites software elements, the claim is reasonably interpreted as directed to a combination of software elements. While the preamble recites a system, the claim as a whole cannot reasonably be interpreted as a machine, since under 101, a machine is defined as a

physical device or a combination of devices having functionalities to effect an action or a result, and the software is not physical devices or objects. Thus, the claim only recites software per se (descriptive material covered in MPEP 2106.01), which constitute as non-statutory subject matter.

Regarding claim 20, the claimed invention in claim 20 is a computer program lacking the necessary physical components (hardware) required for execution. Since claim 20 is clearly not a process, machine, manufacture or a composition of matter, it fails to fall within a statutory category and thus non-statutory.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-12, and 14-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Narkilar ("Space-Efficient Implementation of Nested Parallelism",7/1997,ACM, Pages 25-36).

Regarding claim 1, Narkilar teaches a method of scheduling a plurality of tasks in a data processing system, each task having suspension data specifying suspension of the task based on memory usage associated therewith, the method comprising: processing one of the plurality of tasks (page 26, paragraph 1, lines 5-7); monitoring for an input indicative of memory usage of the task matching the suspension data

associated with the task(page 26, paragraph 1, lines 9-10); suspending processing of said task on the basis of said monitored input (page 26, paragraph 1, lines 11-12); and processing a different one of the plurality of tasks (page 26, paragraph 1, lines 13-14).

Regarding claim 3, Narkilar teaches a method according to claim 1, in which said input comprises data indicative of a suspension request (page 26, paragraph 1, lines 9; page 26, paragraph 2, lines 18-20).

Regarding claim 4, Nakilar teaches a method according to claim 1, in which said input comprises data indicative of memory usage of the task (page 26, paragraph 1, lines 9), the method further comprising identifying when the memory usage matches the suspension data associated with said task (page 26, paragraph 1, lines 10-13).

Regarding claim 5, Nakilar teaches a method according to claim 1, including monitoring termination of tasks (page 29, left column, paragraph 1, lines 1-2) and repeating said step of identifying availability of memory in response to a task terminating (page 29, left column, paragraph 1, lines 2-4).

Regarding claim 6, Nakilar teaches on a response to identifying sufficient memory to execute the remaining tasks (page 29, right column, paragraph 1, lines 2-6; in order for the parent thread to reactivate, it has to have sufficient memory), monitoring step is deemed unnecessary (since the parent thread is reactivated, the monitoring step will not occur).

Regarding claim 7, Nakilar teaches a scheduler for use in a data processing system, the data processing system being arranged to execute a plurality of tasks and having access to a specified amount of memory for use in executing the tasks, the

scheduler comprising: a data receiver arranged to receive data identifying maximum memory usage associated with a task (page 27, section 3, paragraph 1, lines 3-6; the DAG stores the unit of memory that corresponds with each node); an evaluator arranged to identify, on the basis of the received data, whether there is sufficient memory to execute the tasks (page 27, section 3, paragraph 1, lines 7-9; { *M(v) is the algorithm that determines if there is enough memory}*); a selector arranged to select at least one task for suspension during execution of the task, said suspension coinciding with a specified memory usage by the task; wherein, in response to the evaluator identifying that there is insufficient memory to execute the plurality of tasks, the selector selects one or more tasks for suspension, on the basis of their specified memory usage and the specified amount of memory available to the data processing system, and the scheduler suspends execution of the or each selected task in response to the task using the specified memory (page 27, section 3, paragraph 1, line 9-10; if *M(v) comes back negative, then the memory is de-allocated, causing suspension of task or tasks*).

Regarding claim 8, Nakilar teaches a scheduler according to claim 7, wherein the evaluator is arranged to monitor termination of tasks, and in response to a task terminating, to identify whether there is sufficient memory to execute the remaining tasks (Page 29, right column, lines 6-8).

Regarding claim 9, Nakilar teaches a scheduler according to claim 7, wherein the data identifies an execution deadline associated with the task (page 29, right column, paragraph 3, lines 9-12; *M/K* is the amount of space is allocated and when that is reach, the task is suspended or terminated).

Regarding claim 10, Nakilar teaches a scheduler according to claim 9, wherein, in response to the evaluator identifying sufficient memory to execute the remaining tasks(page 29, right column, paragraph 1, lines 14-18), the scheduler is arranged to identify a task without an execution deadline and schedule the identified task (page 29, right column, paragraph 1, lines 14-19).

Regarding claim 11, Nakilar teaches a scheduler according to claim 8, wherein, in response to the evaluator identifying sufficient memory to execute the remaining tasks (page 29, right column, paragraph 1, lines 14-18), the selector is arranged to deselect said selected one or more tasks (page 28, right column, Algorithm description, lines 2-3).

Regarding claim 12, Nakilar teaches a data processing system arranged to execute a plurality of tasks, comprising: memory arranged to hold instructions and data during execution of a task (Page 26,left column, paragraph 4, lines 1-2); receiving means arranged to receive data identifying maximum memory usage associated with a task (page 27, section 3, paragraph 1, lines 3-7) ; evaluating means arranged to identify, on the basis of the received data, whether there is sufficient memory to execute the tasks (page 27, section 3, paragraph 1, lines 7-9); and a scheduler arranged to schedule execution of the tasks on the basis of input received from the evaluating means, wherein, in response to identification of insufficient memory to execute the plurality of tasks, the scheduler is arranged to suspend execution of at least one task in dependence on memory usage by the task (page 27, section 2, paragraph 3, lines 7-10).

Regarding claim 14, Nakilar teaches a method of transmitting data to a data processing system, the method comprising: transmitting data for use by the data processing system in processing a task (page 27, section 2,paragraph 1, lines 1-3); and transmitting suspension data specifying suspension of the task based on memory usage during processing thereof, wherein the data processing system is arranged to perform a process comprising: monitoring for an input indicative of memory usage of the task matching the suspension data associated with the task (page 27, section 2, paragraph 1, lines 9-10); and suspending processing of said task on the basis of said monitored input (page 27, section 2,paragraph 1, lines 10-11).

Regarding claim 15, Nakilar teaches a method according to claim 14, wherein the suspension data identifies at least one point at which processing of the task can be suspended, based on memory usage of the task (page 27, section 2, paragraph 3, lines 9-10).

Regarding claim 16, Nakilar teaches a method according to claim 14, wherein the suspension data includes data identifying maximum memory usage associated with the task (page 27, section 2, paragraph 3, lines 4-5; the memory allocated becomes a private pool of memory).

Regarding claim 17, Nakilar teaches a method according to claim 15, wherein the task comprises a plurality of sub-jobs and said data identifying at least one point at which processing of the task can be suspended corresponds to each such sub-job (page 27, section 2, paragraph 1, lines 9-16).

Regarding claim 18, Nakilar teaches a method of configuring a task for use in a data processing system, the method including associating suspension data with the task, the suspension data specifying suspension of the task based on memory usage associated therewith, wherein the data processing system is arranged to perform a process in respect of a plurality of tasks, the process comprising: monitoring for an input indicative of memory usage of the task matching the suspension data associated with the task (page 26, paragraph 1, lines 9-10); and suspending processing of said task on the basis of said monitored input (page 26, paragraph 1, lines 11-12).

Regarding claim 19, Nakilar teaches a method according to claim 18, further comprising identifying a data processing system configured to process the task and transmitting said suspension data to the data processing system (page 27, section 3, paragraph 1, lines 7-10; page 26, paragraph 1, 13-15).

Regarding claim 20, it talks about a computer program comprising a set of instructions arranged to cause a processing system to perform the method according to claim 1 and is rejected under the same rationale as applied to claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Narkilar ("Space-Efficient Implementation of Nested Parallelism",7/1997,ACM, Pages 25-36) in view of Streit ("On the Job Scheduling for HPC-Clusters and the dynP Scheduler", 12/2001, INSPEC, pages 62-63).

Regarding claim 2, Nakilar teaches on the methods of claim 1, however is silent to the fact of receiving first data identifying maximum memory usage associated with the plurality of tasks; receiving second data identifying memory available for processing the plurality of tasks; and identifying, on the basis of the first and second data, whether there is sufficient memory available to process the tasks; in which said monitoring and suspending steps are applied only in response to identifying insufficient memory.

However, Streit teaches on receiving first data identifying maximum memory usage associated with the plurality of tasks (Section 5, paragraph 2, line 2); receiving second data identifying memory available for processing the plurality of tasks (Section 5, paragraph 2, line 3); and identifying, on the basis of the first and second data, whether there is sufficient memory available to process the tasks (Section 5, paragraph 3, lines 1); in which said monitoring and suspending steps are applied only in response to identifying insufficient memory (Section 5, paragraph 3, lines 2-4).

It would be obvious to one of an ordinary skill in the art at the time of the invention to incorporate the teachings Streit into the method of Nakilar to take all the data received and determine if enough memory is available to complete the tasks at hand. The modification would have been obvious because one of the ordinary skills in the art would have included a scheduling strategy to determine the available resources

to execute a plurality of tasks to achieve optimal performance in a data processing system.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Narkilar ("Space-Efficient Implementation of Nested Parallelism",7/1997,ACM, Pages 25-36) in view of Jones et al. (Jones) US Patent 5587298.

Regarding claim 13, Nakilar teaches on the methods of claim 12 (previously discussed), however he is silent to the fact on further comprising a digital television system. However, Jones teaches of a digital television system (see abstract).

However it would be obvious to one of an ordinary skill in the art at the time of the invention to incorporate the teachings Jones into the method of Nakilar to use a computer video graphics adapter and monitor to be incorporate with a digital television system. The modification would have been obvious because one of the ordinary skill in the art would have included a data processing system to determine the available resources to execute a plurality of tasks to achieve optimal performance with a digital television system.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOUGLAS BRYANT whose telephone number is (571)270-7707. The examiner can normally be reached on M-F 8:00-5:00pm Est.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Robertson can be reached on 571-272-4186. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. B./
Examiner, Art Unit 4123

/Emerson Puente/
Primary Examiner, Art Unit 2113